

We claim:

1. A data link layer processor comprising:

one or more media access controllers (MACs);

5 a traffic shaper, operatively coupled to the one or more MACs, for discarding
one or more frames that exceed a bandwidth requirement prior to
transmission to the MACs.

2. A switching device comprising:

10 one or more physical layer interfaces for transmitting frames to a
communication network;

a network processor for routing the frames towards the one or more physical
layer interfaces; and

a plurality of data link layer processors, wherein each data link layer processor
15 comprises:

one or more MACs, wherein each MAC is operatively coupled to a
physical layer interface; and

a traffic shaper, operatively coupled to the one or more MACs, for
discarding one or more frames from the network processor that exceed
20 one or more bandwidth parameters prior to transmission to the MACs.

3. The switching device of claim 2, wherein the traffic shaper discards the one or more
frames in accordance with a Three Color Marker (TCM) algorithm.

25 4. The switching device of claim 3, wherein the TCM algorithm is selected from the
group consisting of: single rate TCM, two rate TCM, and a combination thereof.

5. The switching device of claim 2, wherein the traffic shaper comprises:

an meter module for determining a flow rate associated with the frames received
30 from the network processor; and

a discard control logic for selectively discarding said one or more frames based

upon the flow rate and the one or more bandwidth parameters.

6. switching device of claim 5, wherein the traffic shaper further comprises a marker module for marking the plurality of frames in accordance with a TCM algorithm.

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7. The switching device of claim 6, wherein the one or more bandwidth parameters comprise a committed information rate (CIR) and an excess burst size (EBS).

10 8. The switching device of claim 2, wherein the traffic shaper comprises a flow search engine for classifying frames from the network processor based upon one or more properties associated with the frames.

9. The switching device of claim 8, wherein the flow search engine comprises a content addressable memory (CAM).

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10. The switching device of claim 8, wherein the CAM associated with each of the plurality of data link layer processors consists of QoS rules pertaining to the associated plurality of physical layer interfaces.

20 11. The switching device of claim 2, wherein data link layer processors are media access controller (MAC) processors.

12. The switching device of claim 2, wherein the switching device is selected from the group consisting of: a router, a multi-layer switching device, and a switch blade.

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